



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,603	01/31/2006	Jin-Seok Lee	P10008US	5762
20529 7590 08/17/2009 THE NATH LAW GROUP 112 South West Street Alexandria, VA 22314				
EXAMINER				
JOHNSON, KEVIN M				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
08/17/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/566,603

**Applicant(s)**

LEE ET AL.

**Examiner**

KEVIN M. JOHNSON

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 April 2009.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
4a) Of the above claim(s) 5-15, 17 and 18 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-4 and 16 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 31 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 1/31/2006  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of Group I, claims 1-4 and 16, in the reply filed on 4/16/2009 is acknowledged. The traversal is on the ground(s) that the groups share a special technical feature and therefore possess unity of invention. This is not found persuasive because the groups do not contain a special technical feature. While applicant argues that the special technical feature is a uniformly aligned template, such a feature is not present in all of the groups as required for the unity of invention standard and therefore can not constitute a special technical feature. The argument that the uniformly aligned polymer film of Group II and the uniformly aligned polymer mass of Group III are the same as the uniformly aligned template of Group I, constituting a special technical feature is not persuasive. The uniformly aligned template may be a polymer film or mass, but is not required to be and the materials of Groups II and III are not required to be capable of use as a uniformly aligned template. Therefore Groups I-III also lack a special technical feature. The argument that no explanation of a serious burden on the examiner has been provided is moot, as the inventions have been shown to lack unity of invention under 37 CFR 1.475 an explanation of serious burden is not required in this national stage application. The serious burden requirement applies to US applications; the standard for national stage applications is based upon 37 CFR 1.475. No requirement has been made for the filing of divisional applications. Further, statements of financial burden do not constitute

proper grounds for the traversal of a restriction requirement. The requirement is still deemed proper and is therefore made FINAL.

2. Claims 5-15, 17 and 18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 4/16/2009.

***Information Disclosure Statement***

3. The information disclosure statement (IDS) submitted on 1/31/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al. (J. Am. Chem. Soc., 2001, 123, pp. 9769-9779).

In regard to claims 1, 2 and 4, Yoon teaches a method of assembling a highly ordered zeolite layer from multiple micrometer scale zeolite crystals. The process comprises the use of alternately layered oppositely charged polyelectrolytes to induce the organization of the highly ordered zeolite material on a substrate. The produced zeolite material is ZSM-5, a MFI structure type material. Yoon fails to teach that the polyelectrolyte layer is uniformly aligned.

It would have been obvious to one of ordinary skill in the art at the time of the invention that the layered polyelectrolyte structure would be uniformly aligned. The disclosure in Yoon that the zeolite material templated by the polyelectrolyte layer displays a highly ordered uniform alignment would lead one of ordinary skill in the art at the time of the invention to conclude that the structure directing polyelectrolyte layer must also be uniformly aligned.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon in view Baldo et al. (Adv. Mater., 1998, 10, No. 18, pp. 1505-1514).

In regard to claim 16, Yoon fails to disclose a method for forming the template that meets the requirements of the instant claim.

Baldo teaches a method for the formation of polymer films on substrates. The method includes the use of low pressure organic vapor phase deposition of the films. In this process up to three different source materials may be used independently to grow successive layers of material on the substrate by utilizing a carrier gas to transport source material vapors in to a reactor containing the substrate. This method allows for the growth of highly uniform film structures (p. 1151).

It would have been obvious to one of ordinary skill in the art to utilize the process described by Baldo to form a polymer film template for use in the process disclosed by Yoon. Such a modification would have been motivated by the teaching in Yoon that ordered zeolites may be produced by utilizing a multilayer polymer template on a substrate, and the disclosure in Baldo that the vapor deposition process allows for the formation of a highly uniform polymer film. Therefore, the use of the process disclosed by Baldo would result in a template material with increased uniformity. It would have been obvious to one of ordinary skill in the art at the time of the invention that the polymer film produced by the method disclosed in Baldo would be uniformly aligned. The method meets all the requirements of the method required in the instant claim, and would therefore be expected to produce a material meeting the requirements of the instant claim. It would have been further obvious to one of ordinary skill in the art at the

time of the invention to cycle the deposition steps in the method disclosed by Baldo.

Such a modification would allow for the production of multilayer polymer films, increasing the industrial applicability of the process disclosed by Baldo and the teaching in Yoon that the polymer may be in the form of a multilayer film.

9. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (Adv. Mater., 2001, 13, No. 16, pp. 1259-1263) in view of Raukola (Thesis, VTT Publications 361, Espoo, 1998).

In regard to claims 1 and 2, Lee discloses a method for the production of zeolite materials utilizing polyurethane foam templates. The produced silicalite-1 and ZSM-5 foams exhibit the exact structure of the polyurethane templates (p. 1261). Lee fails to teach that the polymer foam templates are uniformly aligned.

Raukola teaches a biaxially aligned polymer foam.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize an aligned polyurethane film as the template in the process disclosed by Lee. Such a modification would have been motivated by the teaching in Raukola of biaxially oriented polymer foams, and the teaching in Lee that the zeolite produced utilizing a polyurethane foam template displays the structure of the template. The combination of these teachings would allow for the production of a uniformly aligned structure of zeolite crystals with a more versatile industrial applicability than randomly oriented zeolite materials.

In regard to claim 3, it would be obvious to one of ordinary skill in the art at the time of the invention that the polyurethane utilized by Lee would be capable of releasing

an amine group in acidic or alkaline conditions. Further, polyurethanes are a preferred template material employed in the instant invention.

In regard to claim 4, the ZSM-5 zeolite material produced by Lee is of the MFI structure type.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view Baldo et al. (Adv. Mater., 1998, 10, No. 18, pp. 1505-1514).

In regard to claim 16, Lee fails to disclose a method for forming the template that meets the requirements of the instant claim.

Baldo teaches a method for the formation of polymer films on substrates. The method includes the use of low pressure organic vapor phase deposition of the films. In this process up to three different source materials may be used independently to grow successive layers of material on the substrate by utilizing a carrier gas to transport source material vapors in to a reactor containing the substrate. This method allows for the growth of highly uniform film structures (p. 1151).

It would have been obvious to one of ordinary skill in the art to utilize the process described by Baldo to form a polymer film template for use in the process disclosed by Lee. Such a modification would have been motivated by the teaching in Lee that the zeolite produced utilizing a polyurethane template displays the structure of the template, and the disclosure in Baldo that the vapor deposition process allows for the formation of a highly uniform polymer film. Therefore, the highly uniform material produced by Baldo would result in a zeolite material with increased uniformity. It would have been obvious to one of ordinary skill in the art at the time of the invention that the polymer film



produced by the method disclosed in Baldo would be uniformly aligned. The method meets all the requirements of the method required in the instant claim, and would therefore be expected to produce a material meeting the requirements of the instant claim. It would have been further obvious to one of ordinary skill in the art at the time of the invention to cycle the deposition steps in the method disclosed by Baldo. Such a modification would allow for the production of multilayer polymer films, increasing the industrial applicability of the process disclosed by Baldo.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
12. Feng et al. (Nature, Vol. 368, 1994, pp. 834-836) discloses a method for the growth of oriented molecular sieve crystals on organophosphonate films.
13. WO 01/96106 discloses a method for linking zeolite crystals in a two-dimensional or three-dimensional manner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN M. JOHNSON whose telephone number is (571)270-3584. The examiner can normally be reached on Monday-Friday 7:30 AM to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin M. Johnson/  
Examiner, Art Unit 1793

/Elizabeth D. Wood/  
Primary Examiner, Art Unit 1793